

June 25, 1935.

T. SCHILDER ET AL

2,006,060

SIFTPROOF PACKAGE AND METHOD OF MAKING THE SAME

Filed Jan. 21, 1933

2 Sheets-Sheet 1

Fig. 1.

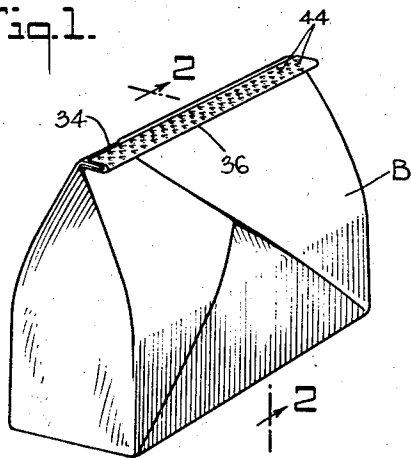


Fig. 2.

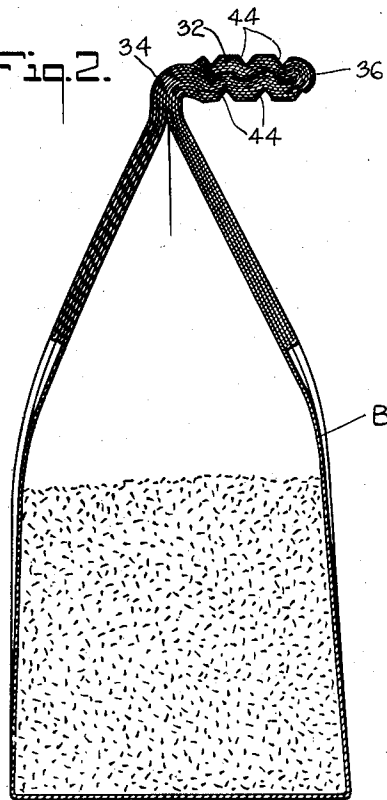


Fig. 4.

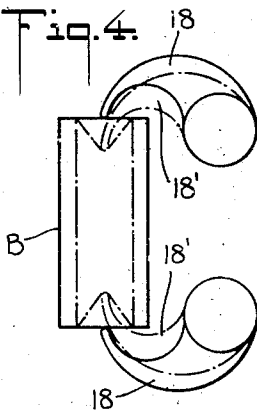


Fig. 5.

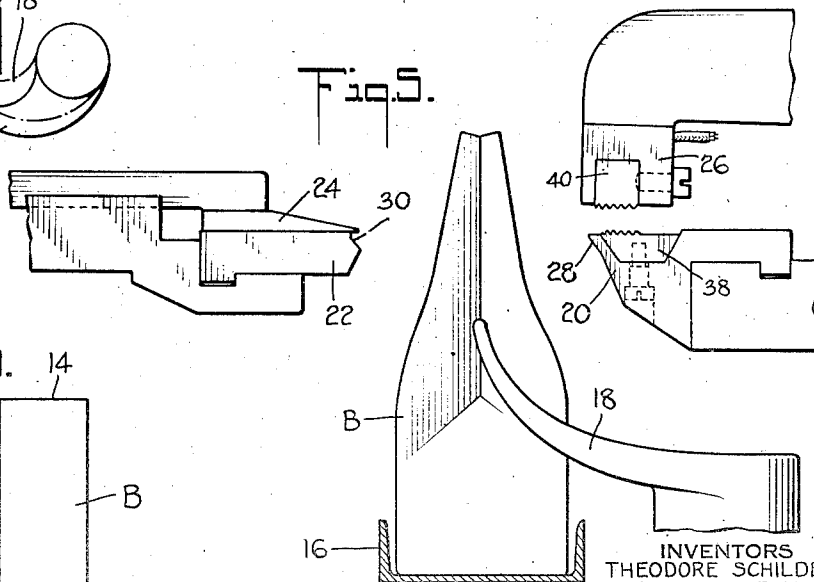
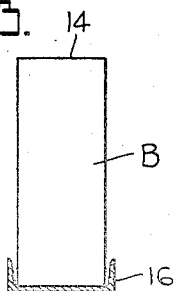


Fig. 3.



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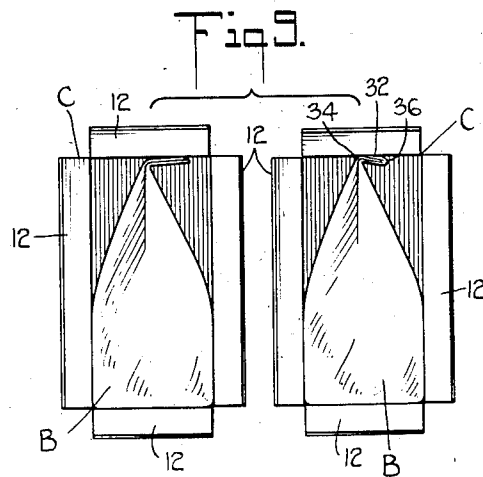
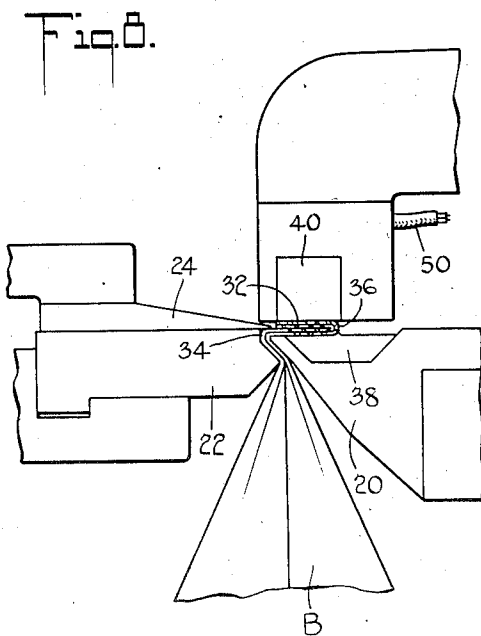
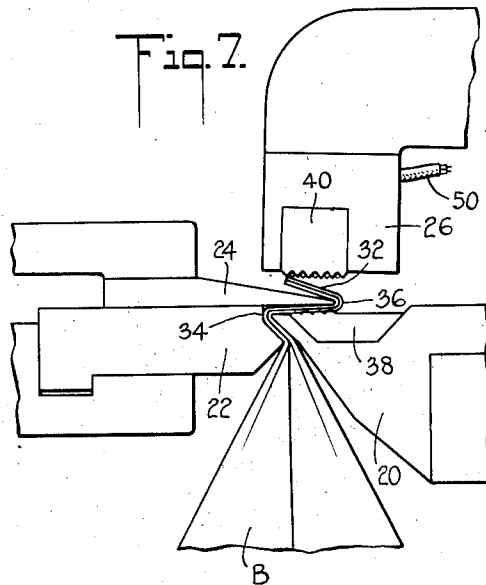
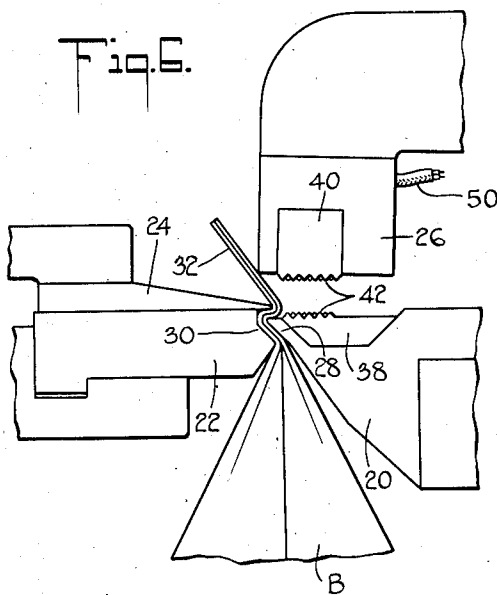
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SIFTPROOF PACKAGE AND METHOD OF MAKING THE SAME

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2 Sheets-Sheet 2



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2,006,060

SIFTPROOF PACKAGE AND METHOD OF
MAKING THE SAME

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Application January 21, 1933, Serial No. 652,848

19 Claims. (Cl. 229-62)

This invention relates to packages and bags, particularly of the Anderson type, and more particularly to a method of closing the same and of keeping the same in closed condition.

5 A popular form of carton for packaging of gelatin and other powdery materials is disclosed, for example, in Anderson Patent 1,151,233, issued August 24, 1915. This package comprises an outer carton having rectangular walls and receiving and protectively housing an inner bag, the said bag preferably being made of a single rectangular piece of paper folded to form a rectangular bottom wall and creased side walls. The open edges of the bag are gathered together and folded sidewardly, the carton preferably being dimensioned so as to hold the gathered edges in their folded or sidewardly displaced position.

The primary and general object of the present invention is to improve a package of the Anderson type, and more particularly to improve the closing and sealing of the bag opening so as to make the same sift-proof and moisture-proof. A further object of our invention is to provide the bag with closing folds so disposed and so directed that they will be held in sealed relation by the carton. Still another object of our invention resides in the provision of a method for locking together the gathered and folded edges of the bag so as to hold the same in folded and sealed condition independently of the aid afforded by the carton. Still another object of our invention resides in the provision of a method for doubly folding the gathered upper portion of the bag, all in a single operation which may be performed by relatively simple apparatus operating at extremely high speed. Inasmuch as a considerable number of layers or thicknesses of paper are gathered together at the upper edge of a bag of the Anderson type, this gathered portion when folded results in relative displacement of the successive layers of paper; and further objects of our invention are to so direct the multiple folds of the material that these displacements tend to compensate for one another and are all taken care of before the edges are finally compressed or locked in sealed condition, so that there is no tendency to loosen the sealed edges by displacement of the layers of material during a bending or folding operation.

Still further objects of the present invention reside in the provision of a bag closure which will be satisfactory even with cold operation, thereby permitting the bags to be closed at a high rate of speed, and which at the same time may, if desired, involve heating as well as com-

pression of the gathered top of the bag when the bag is made of wax paper so as to combine the advantages of a wax seal with the rapidity of operation of a cold seal.

To the accomplishment of the foregoing and such other objects as will hereinafter appear, our invention consists in the sift-proof package and the components thereof, as well as the steps in the method of making the same, and their relation one to the other as hereinafter are more particularly described in the specification and sought to be defined in the claims. The specification is accompanied by drawings in which:

Fig. 1 is a perspective view of a bag closed in accordance with our invention;

Fig. 2 is an enlarged section taken in the plane of the line 2-2 in Fig. 1;

Fig. 3 is an end elevation of a bag after filling and before closing the same;

Fig. 4 is a plan view explanatory of the tucking operation;

Fig. 5 is an end elevation of the tucked bag;

Fig. 6 shows the pinching and preliminary folding of the gathered upper portion of the bag;

Fig. 7 illustrates the completion of the folding operation;

Fig. 8 shows the compression and locking of the reversely folded bag top; and

Fig. 9 is explanatory of the relation of the bag to the protective carton in which it is placed.

As is well understood by those familiar with packages of the Anderson type, and as may be found by reference to Anderson Patent 1,151,233, issued Aug. 24, 1915, this package, which is most commonly used for measured quantities of powder gelatin or other prepared desserts for household use, comprises an outer carton C in which there is protectively housed an inner preferably moisture-proof bag B, as will be evident from an inspection of Fig. 9. The carton C is rectangular-walled with opposite ends closed by flaps formed by extensions of the side walls. In Fig. 9 one end of the carton has been opened, the flaps 12 being shown in foreshortened condition and being thrown outwardly to expose the inner bag B.

The bag is ordinarily made of a single rectangular piece of preferably waxed paper which is so folded by a downwardly moving plunger having a rectangular end as to form a rectangular bottom wall and creased side walls. After the bag has been filled with a measured amount of material, the end walls are tucked inwardly, as will be clearly evident from an in-

spection of Figs. 1, 4, and 5, and the upper edges of the bag are gathered together and compressed to close the bag. The practice heretofore has been to bend or fold the gathered upper portion of the bag sidewardly, as is indicated in the left-hand portion of Fig. 9. Because of the many advantages of this form of package, it has proved to be popular and has gone into extensive use, but nevertheless the package is characterized by the disadvantage that the bag is not truly sift-proof nor moisture-proof.

In accordance with the present improvement, the gathered upper portion of the bag is doubly folded so as to provide a truly sift-proof closure, and the manner in which this is preferably done will be evident from an inspection of Fig. 1, Fig. 2, or the right-hand portion of Fig. 9 showing how the gathered bag material is folded not only sidewardly but also upwardly and reversely, so that there is both an inner as well as an outer fold line, while both of these folds and particularly the outer fold are kept in closed condition by the relation of the bag to the carton, the vertical dimension of the carton preferably coinciding with the vertical dimension of the bag. The outer fold of the bag may further be permanently and securely locked in closed condition independently of the support rendered by the surrounding carton by compressing and at the same time forcibly indenting or, even more preferably, perforating the bag material, as will be evident from an inspection of Figs. 1 and 2 of the drawings.

Considering the method of our invention in greater detail, the bag B is shown at an intermediate stage of its manufacture in Fig. 3. At this time the bag is still open at its top edge 14 and has already been filled with a measured charge of material. A series of these bags are moved step by step along any appropriate guide rail system 16 until the closing mechanism, schematically indicated in Figs. 4 and 5, is reached. At the station in question a pair of tucker fingers 18 are oscillated about a horizontal axis until disposed at opposite ends of the bag, as is shown in Fig. 4, and are then oscillated toward one another about a vertical axis to tuck the ends of the bag inwardly, as is shown by the broken line positions of the fingers 18' and the broken line condition of the bag B. The end plaits or gussets then formed by fingers 18 are clearly evident from an inspection of both Figs. 4 and 5.

Besides the tucking fingers 18, the bag-closing station further comprises relatively movable members which may be referred to as the anvil 20, the pincher 22, the folder 24, and the hammer 26. When the bag B reaches the closing station and during the tucking operation, the parts 20, 22, 24, and 26 are all in spaced or retracted position, as is shown in Fig. 5. Immediately upon completion of the tucking operation, the anvil 20 and pincher 22 are relatively moved until the opposed faces 28 and 30 thereof clamp or pinch the upper portion of the bag in the manner shown in Fig. 6 of the drawings. In the particular case here shown both the anvil 20 and the pincher 22 move toward one another and clamp the bag in mid-position, but it will be evident that variations of this arrangement may, if desired, be employed. This operation establishes a measured height for the closed bag and gathers and clamps the various layers of material in the upper portion of the bag together, the material 32 above the jaws 20 and 22 being

then available for the further closing operations next described.

The folder slide 24 is movable independently of pincher bar 22, but, during the clamping operation shown in Fig. 6, the slide 24 preferably moves along with pincher bar 22. Immediately after the bag is seized, however, slide 24 moves further than pincher bar 22, thus forcing the gathered upper portion 32 of the bag toward the right or over onto the upper surface of anvil 20. It will be noted, however, that hammer 26, even in its most elevated position, is substantially lower than the top edge of the bag so that it bears against and tends to prevent the upper portion 32 of the bag from being laid over the anvil by the slide 24. Instead, the gathered portion 32 of the bag is folded intermediate the zone clamped by the jaws 20 and 22 and the top edge of the bag, as is clearly shown in Fig. 7, so that in effect the gathered portion 32 of the bag is doubly folded, an inner fold 34 being provided at the clamping jaws, and an outer fold 36 being provided by the folder slide 24.

The timing of the machine is so regulated that folder slide 24 is then retracted and at the same time hammer 26 descends and compresses the reversely folded bag materials and clamps the same under extremely high pressure, the condition of the parts then being indicated in Fig. 8. In order to securely lock the bag in closed condition we prefer to provide the anvil 20 and hammer 26 with hardened inserts 38 and 40 the opposing faces of which are provided with staggered rows of mating teeth 42. These teeth engage the reversely folded gathered bag material, and the pressure exerted between hammer 26 and anvil 20 is preferably made sufficiently great so that the teeth not only indent the material but, further, actually penetrate partially through the multiple layers of bag material, thereby locking the same tightly together. The parts 20, 22, 24, and 26 are then retracted to the position shown in Fig. 5, thereby releasing the bag for movement to a later station where the bag is loaded into the surrounding carton C. At this time the bag is in the condition shown in Fig. 1 where the indentations or perforations 44, produced by the teeth 42, are clearly evident. It should be understood that the bag as thus closed is preferably sift-proof. The fact that powder may conceivably pass between the indentations 44 is of no consequence because the primary function of the indentations or perforations 44 is to hold the fold 36 in tightly closed condition, and this fold alone is ample to effectively prevent any sifting of the powder out of the bag. It is particularly effective because the initial or inner fold 44 is alone sufficient to greatly minimize any attempted sifting of material from the bag, so that the operation of the outer fold 36 is of a safety or extraprecautionary nature. At this point it may be mentioned that the mating faces of the pincher jaws 20 and 22 are preferably arranged at a substantial angle or bias, as is clearly evident from an inspection of Figs. 5, 6, 7, and 8, so that the upper portion of the bag is folded at an acute rather than merely a right angle, thereby insuring extra tightness and extra sharpness of the inner fold 34. This bias of the surfaces 28 and 30 may, however, be interrupted or straightened out for a very slight distance at the upper edges of the jaws in order not to injure the paper of the bag and in order to minimize any tendency of the jaws to slide one below the other.

The paper out of which the bag is made is ordinarily a waxed paper, and the closure of the bag may be made additionally effective and moisture-proof by heating the same to increase the adherence of the laminations of paper. For this purpose the hammer 26 preferably has incorporated therein an electrical heating or resistance unit energized through flexible leads 50. Of course, heating may alone be relied upon to hold the folded edges of the bag in closed condition, thus dispensing with the indentations or perforations 44, but our experience shows that for the production of an effective seal in this manner the heating must be continued over a substantial period of time, whereas a cold closure, such as is produced by the use of the indentations or perforations 44, does not necessitate any delay or dwell in the machine. With the present process the bags may be closed at the rate of sixty per minute, for example, representing a clamping period which is wholly inadequate to obtain a dependable hot sealing of the bag. We therefore prefer to use the cold closure method shown, but may and sometimes do additionally employ heating to improve the seal obtained by reason of the slight fusion and adherence of wax obtained despite the rapid speed at which our process is preferably practiced. It will further be appreciated that the anvil 20 or/and the pincher bar 22 may be heated in addition to or in lieu of the hammer 26.

While we have termed the compression member 26 a hammer, it should be understood that it need not operate percussively, but that, on the contrary, it may be and preferably is operated by a positive clamping pressure which is applied gradually instead of percussively. In effect, the multiple layers at the upper portion of the bag are squeezed together under extremely high pressure, which mutilates the bag in a manner difficult to illustrate although some idea of the finished condition of the bag may be obtained by an inspection of the section shown in Fig. 2.

The closed bag shown in Fig. 1 is next loaded into a surrounding carton, and the vertical dimension of this carton is preferably made equal to the height of the closed bag, so that the bag assumes a position in the carton somewhat as is illustrated in the right-hand portion of Fig. 9. With this arrangement it will be evident that the top of the carton holds the bag in closed condition, and in fact we find that surprisingly dependable results may be obtained when placing reliance solely upon the carton for keeping the bag closed. This is true because the reverse folding of the bag to form the outer fold 36 is upwardly, rather than downwardly, so that the tendency of the bag within the carton is to keep the fold 36 tightly closed rather than to let the same open. At the same time, the inner fold 34 is also kept closed. The double thickness of the reversely folded bag material causes the inner fold 34 to be kept at somewhat acute rather than obtuse an angle which is desirable for a tight seal. At the same time, no opening of the outer fold 36 takes place by reason of relative displacement of the layers of material, first, because the initial fold given the bag at 34 is an acute rather than a simple right-angle; and secondly, because the reversely bent material is locked together by the perforations or indentations, and tends to oscillate as a permanent and solid unit about the fold 34.

It is believed that the package of our invention and particularly the bag closure, as well as the method of producing the same, will be apparent from the foregoing detailed description. It will also be appreciated that the present package is far superior to that heretofore employed because it is made truly sift-proof by being doubly folded. The perforations or indentations are effective despite possible passage of powder therebetween because their primary function is merely to hold the reversely bent upper portion of the bag in tightly folded condition. The particular manner in which the double fold is obtained, the top edge of the bag being bent upwardly and reversely rather than downwardly and reversely, is also characterized by a number of important advantages. In the first place, the double fold may be obtained by a single operation with relatively simple apparatus at a single closing station, and the closing operation may be performed exceedingly rapidly. In the second place, relative displacement of the layers of paper is taken care of when the bag is closed in a single operation, in contrast, for example, with the use of successive operations, for with the latter an outer seal or fold may be opened and entirely spoiled by the subsequent production of an inner fold by reason of the latter causing a relative displacement of the different layers of material at the outer fold. Thirdly, the relative displacements of the inner and outer folds take place in opposite directions and therefore tend to compensate for one another, so that in the completed bag the edges of the paper are substantially coincident, as is shown in Fig. 2. This feature is important when dealing with a bag of the Anderson type in which many layers of material are gathered together at the top of the bag, because a considerable thickness or bulk of material is involved and successive bends in the same direction tend to cause an extreme shortening of the outer layers relative to the inner layers of paper. Fourthly, an upwardly reversed fold, in contrast with a downwardly reversed fold, causes the carton to hold the fold in sealed condition. Fifthly, the securely locked outer fold which we produce is so dependable that the closed upper portion of the bag may be oscillated about the inner fold without opening the outer fold, and consequently the bag and carton may be so relatively dimensioned that the carton will tend to hold even the inner fold of the bag closed in addition to holding the outer fold of the bag closed. Sixthly, a dependable and permanent closure is obtained by a cold process which permits the utmost rapidity of operation. However, when dealing with a waxed paper it is additionally possible to heat the closing apparatus so as to obtain some melting and additional sealing between the layers of paper. This seal is effective despite the short time of application of heat because it need not be great enough to hold the parts in mechanically adherent relation since the parts are really held in the desired structural relation by the perforations or indentations as well as by the carton, so that no stress is applied to the waxed surfaces which might disturb an initially produced cohesion. Seventhly, both the inner and outer folds are produced while holding the bag in a generally upright condition so that any powder clinging to the sides of the bag following the filling operation tends to be dislodged and to fall downwardly into the bag during the closing operation. Conversely, when the bag is opened by the consumer the upper portion tends to open into a vertical condition rather than a curled-over condition, and consequently any

powder which may sift into the upper part of the bag during shipment tends to fall back into the bag when the bag is opened. Another advantage of the present process resides in the fact that already existing machines of the Anderson type may be modified to adopt the new process, and this is an important feature because a large number of such machines are already in current use.

10 The mutilation of the bag by the knurled surfaces will be referred to as "indentations or perforations", because a combination of both is produced. The teeth compress the paper so hard that the outer layers are actually perforated, although the inner ones may be merely indented. 15 The perforations are not clean-punched holes but instead are flanged by lips of inwardly struck paper which are forced through the holes in the next inner layers of paper, and so on, so that the multiple layers are well locked together. 20 The locked bag top may be bent about fold 34 without opening, hence a tight fit in the carton is permissible, as shown at the right side of Fig. 9. It is not necessary to leave clearance above the bag top to produce an obtuse angle, as shown at 25 the left side of Fig. 9.

The paper for the bag need not be wax paper, but if other moisture-proof papers are used it may be desirable not to use heat at all. Even with wax paper the use of heat is unimportant.

30 It will be apparent that while we have shown and described our improved bag and package as well as the method of making the same in preferred forms, many changes and modifications may be made without departing from the spirit of the invention defined in the following claims.

We claim:

1. A finished bag, the said bag in finished state having bottom and side walls, the top of said bag 40 being gathered and folded with a double fold, the inner fold bringing the gathered material in a generally horizontal plane, and the outer fold causing the outer portion of the gathered material to be bent back upon itself, the thus folded gathered material being secured together and the outer fold locked by a series of indentations or perforations in the reversely folded material.

2. A finished bag, the said bag in finished state of the type shown in Anderson Patent 1,151,233, 50 said bag having many thicknesses of paper at its mouth or top, the top of said bag being gathered and folded with a double fold, the inner fold bringing the gathered material in a generally horizontal plane, and the outer fold causing the outer portion of the gathered material to be bent 55 back upon itself, the thus folded gathered material being secured together and the outer fold locked by a series of indentations or perforations in the reversely folded material.

3. A finished bag, the said bag in finished state having bottom and side walls, the material at the top of the bag being gathered together and bent at an inner fold to extend in a generally horizontal direction, the outer extremity of the gathered material being bent reversely on top of the horizontally extending material to form an outer fold.

4. A finished bag, the said bag in finished state having bottom and side walls, the material at the top of the bag being gathered together and bent at an inner fold to extend in a generally horizontal direction, the outer extremity of the gathered material being bent reversely on top of the horizontally extending material to form an outer fold, the superimposed layers of gathered 75

material being secured together to make the bag sift proof.

5. A finished bag, the said bag in finished state having bottom and side walls, the material at the top of the bag being gathered together and bent at an inner fold to extend in a generally horizontal direction, the outer extremity of the gathered material being bent reversely on top of the horizontally extending material to form an outer fold, the superimposed layers of gathered material being locked together by a series of perforations or indentations in the reversely folded material.

6. A finished bag made of waxed paper, the said bag in finished state having bottom and side walls, the material at the top of the bag being gathered together and bent at an inner fold to extend in a generally horizontal direction, the outer extremity of the gathered material being bent reversely on top of the horizontally extending material to form an outer fold, the superimposed horizontal layers of gathered material being secured together by means of the wax of the waxed paper.

7. A finished bag of the type shown in Anderson Patent 1,151,233, said bag having many thicknesses of paper at its mouth or top, the layers of material at the top of the bag being gathered together and bent at an inner fold to extend in a generally horizontal direction, the outer extremity of the gathered material being bent reversely on top of the horizontally extending material to form an outer fold, the superimposed layers of gathered material being locked together by a series of perforations or indentations in the reversely folded material.

8. A package comprising a carton and a bag carried therewithin, said bag having bottom and side walls, the top of the bag being gathered together and bent horizontally at an inner fold, and the horizontally extending material being upwardly and reversely bent to form an outer fold, the carton being dimensioned in a vertical direction to just receive the bag with its folded top, whereby the bag is held in closed condition by the carton.

9. A package comprising a carton and a bag carried therewithin, said bag having bottom and side walls, the top of the bag being gathered together and bent horizontally at an inner fold, and the horizontally extending material being upwardly and reversely bent to form an outer fold, the thus superimposed layers of gathered material being locked together to make the bag sift proof, the carton being dimensioned at its bottom to receive the bottom of the bag and being dimensioned in a vertical direction to just receive the bag with its doubly folded top, whereby the bag is held in closed condition by the carton.

10. A package of the general type shown in Anderson Patent 1,151,233, comprising a carton and a bag carried therewithin, the top of the bag being gathered together and bent horizontally at an inner fold, and the horizontally extending material being upwardly and reversely bent to form an outer fold, the thus superimposed layers of gathered material being locked together by a series of perforations or indentations in the gathered material, the carton being dimensioned at its bottom to fit the bottom wall of the bag and being dimensioned in a vertical direction to just receive the bag with its doubly folded top, whereby both the outer and inner folds of the bag are held in closed condition by the top of the carton.

11. The method of closing a bag of the general

type shown in Anderson Patent 1,151,233, which includes tucking the side walls to gather the upper portion of the bag, folding the gathered upper portion of the bag sidewardly in order to reversely bend the same to form two oppositely directed folds, and finally locking the reversely bent gathered edges while in horizontal position by perforating or indenting the same under high pressure.

12. The method of closing a bag of the general type shown in Anderson Patent 1,151,233, which includes tucking the side walls, pinching the bag at a point a substantial distance below the top edge of the bag, thereafter simultaneously folding the gathered upper portion of the bag sidewardly and reversely, and compressing the reversely bent horizontally disposed gathered edges.

13. The method of closing a bag which includes tucking the side walls, pinching the bag at a point a substantial distance below the top edge of the bag, at a point intermediate the top edge and the pinched portion of the bag, folding the gathered upper portion of the bag sidewardly in order to reversely bend the same, and finally locking the reversely bent gathered edges by perforating or indenting the same to one another but not to the bag body.

14. The method of closing a bag which includes tucking the side walls and pinching the bag at a point a substantial distance below the top edge of the bag, thereafter folding the gathered upper portion of the bag sidewardly at a point intermediate the top edge and the pinched portion of the bag in order to reversely bend the gathered portion of the bag, and finally sealing the horizontally disposed reversely bent gathered edges by heating and compressing the same in horizontal position.

15. The method of closing a bag of the general type shown in Anderson Patent 1,151,233, which includes tucking the side walls and pinching the bag at a point a substantial distance below the top edge of the bag, thereafter folding the gathered upper portion of the bag sidewardly at a point intermediate the top edge and the pinched portion of the bag in order to reversely bend the gathered portion of the bag in horizontal position, and finally locking the horizontally disposed reversely bent gathered edges by perforating or indenting the same.

16. The method of closing a bag which includes tucking the side walls and pinching the bag at a

point a substantial distance below the top edge of the bag, supporting the gathered top edge of the bag against sideward movement, thereafter pushing the gathered portion of the bag sidewardly at a point intermediate the top and pinched portions of the bag in order to reversely bend the gathered portion of the bag, and finally compressing the reversely bent gathered edges in horizontal position.

17. The method of closing a bag of the general type shown in Anderson Patent 1,151,233, and of retaining the same in closed condition, which includes tucking the side walls, pinching the bag at a point a substantial distance below the top edge of the bag, thereafter simultaneously folding the gathered upper portion of the bag sidewardly and reversely, compressing the reversely bent gathered edges, placing the thus closed bag in a carton the height of which is so dimensioned as to keep the reverse fold of the bag in closed condition, and closing the carton.

18. The method of closing a bag and of retaining the same in closed condition, which includes tucking the side walls, pinching the bag at a point a substantial distance below the top edge of the bag, thereafter folding the gathered upper portion of the bag sidewardly at a point intermediate the top edge and the pinched portion of the bag in order to reversely bend the gathered portion of the bag, compressing the reversely bent gathered edges, placing the thus closed bag in a carton the height of which is so dimensioned as to keep the reverse fold of the bag in closed condition, and closing the carton.

19. The method of closing a bag of the general type shown in Anderson Patent 1,151,233, and of retaining the same in closed condition, which includes tucking the side walls, pinching the bag at a point a substantial distance below the top edge of the bag, thereafter folding the gathered upper portion of the bag sidewardly at a point intermediate the top edge and the pinched portion of the bag in order to reversely bend the gathered portion of the bag, locking the reversely bent gathered edges by perforating or indenting the same, placing the thus closed bag in a carton the height of which is so dimensioned as to keep the top folds of the bag in closed condition, and closing the carton.

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